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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/664,082	09/18/2000	Robert E. Vaughan	PD-990202	3795

7590 04/26/2004

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EXAMINER

DUONG, FRANK

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/664,082

Applicant(s)

VAUGHAN ET AL.

Examiner

Frank Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. This Office Action is a response to the amendment dated 2/25/04. Claims 1-17 are pending in the application.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "*beam-shaping and power-controlling systems enabling TDMA switching between shaped beam modes and spot beam modes of said antenna*" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent in view of Reudink et al (USP 4,188,578) (hereinafter "Reudink").

Regarding **claim 1**, in accordance with Dent reference entirety, Dent discloses a

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multimode transmission system (FIG. 6) using TDMA comprising:

a TDM switch (FIG. 16; block 1601) coupled to a data signal (1600; CALLING CHANNEL DATA; and TIMING CONTROL) (col. 14, lines 40-53), said data signal comprising a plurality of satellite services (1600; CALLING CHANNEL DATA; and TIMING CONTROL), said TDM switch multiplexing said data signal into a TDMA signal (output of block 1601) comprising a plurality of TDMA transmission frames, each TDMA transmission frame having a plurality of downlink frame time slots, wherein each of said downlink frame time slots is dynamically allocated to one of said plurality of satellite services (col. 18, lines 3-21); a modulator (1602) coupled to said TDM switch (1601) and receiving said TDMA signal, said modulator modulating said TDMA signal to generate a modulated TDMA signal (output of 1602) (col. 18, lines 21-26); and a transmit antenna (1603 and antenna (not shown; inherent) or FIG. 18; 1800) comprising beam-shaping, power-controlling coupled to said demodulator and broadcasting said modulated TDMA signal using at least one downlink beam, said at least one downlink beam having a shape and number determined by said data signal (col. 9, lines 60-65, and col. 18, lines 40-57 and col. 23, line 48 to col. 24, line 5 and col. 29, lines 4-5).

Dent fails to explicitly further disclose the limitation of "*beam-shaping and power-controlling systems enabling TDMA switching between shaped beam modes and spot beam modes of said antenna*". However, such limitation lacks thereof from Dent reference is well known and disclosed by Reudink.

In accordance with Reudink reference entirety, Reudink discloses a satellite system comprising, among other things, a beam-shaping and power-controlling systems

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(Fig. 1) enabling TDMA switching (32) between shaped beam modes (Scanning Beams) and spot beam modes (Fixed Beams) of said antenna (col. 3, line 66 and col. 5, line 45) to increase the capacity as well as reducing power requirements and interference (see '578, col. 2, lines 40-49).

Thus, it would have been obvious to those skilled in the art at the time of the invention was made, having the Dent and Reudink references readily available, to implement or incorporate Reudink's beam-shaping and power-controlling system into Dent's system to arrive the claimed invention with a motivation to increase the capacity as well as reducing power requirements and interference (see '578, col. 2, lines 40-49).

Regarding **claim 2**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a timing beacon synchronization data signal (see '257, col. 14, lines 40-53 and col. 28, lines 26-28).

Regarding **claim 3**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a multicast/broadcast data service ('257, col. 29, lines 4-10).

Regarding **claim 4**, in addition to features recited in base claim 3 (see rationales discussed above), Dent in view of Reudink further discloses wherein said multicast/broadcast data service comprises a cell-cast function ('257, col. 29, lines 4-10).

Regarding **claim 5**, in addition to features recited in base claim 4 (see rationales discussed above), Dent in view of Reudink further discloses wherein said cell-cast function comprises multi-casting to individual downlink cells within an uplink cell ('257, *col. 29, lines 4-10*).

Regarding **claim 6**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a calibration data signal ('257, *col. 27, lines 41-52*).

Regarding **claim 7**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a point-to-point data service ('257, *col. 12, lines 25-32*).

Regarding **claim 8**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein each of said plurality of downlink frame time slots is a fixed length of time ('257, *col. 19, lines 5-6*).

Regarding **claim 9**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein each of said plurality of downlink frame time slots is a variable length of time ('257, *col. 19, lines 5-14*).

Regarding **claim 10**, in addition to features recited in base claim 1 (see rationales discussed above), Dent in view of Reudink further discloses wherein said at least one downlink beam has a variable power assigned to ensure link availability and bit-error-rate performance for a coverage area of said at least one downlink beam ('257, *col. 23, lines 48-53*).

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Regarding **claim 11**, in addition to features recited in base claim 1 (see rationales discussed above), Dent f in view of Reudink further discloses wherein a transmission information rate is altered to ensure link availability and bit-error-rate performance for a coverage area of said at least one downlink beam ('257, *col. 44, lines 37-38 and thereafter*).

Regarding **claim 12**, in accordance with Dent reference entirety, Dent discloses a satellite system (FIG. 6) comprising: a ground station (400); a satellite (410) in orbit and in communication with said ground station (400) (see FIG. 6), said satellite having a multimode transmission system using TDMA comprising:

a TDM switch (FIG. 16; block 1601) coupled to a data signal (1600; CALLING CHANNEL DATA; and TIMING CONTROL) (*col. 14, lines 40-53*), said data signal comprising a plurality of satellite services (1600; CALLING CHANNEL DATA; and TIMING CONTROL), said TDM switch multiplexing said data signal into a TDMA signal (output of block 1601) comprising a plurality of TDMA transmission frames, each TDMA transmission frame having a plurality of downlink frame time slots, wherein each of said downlink frame time slots is dynamically allocated to one of said plurality of satellite services (*col. 18, lines 3-21*); a modulator (1602) coupled to said TDM switch (1601) and receiving said TDMA signal, said modulator modulating said TDMA signal to generate a modulated TDMA signal (output of 1602) (*col. 18, lines 21-26*); and a transmit antenna (1603 and antenna (not shown; inherent) or FIG. 18; 1800) beam-shaping, power-controlling coupled to said demodulator and broadcasting said modulated TDMA signal using at least one downlink beam, said at least one downlink

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beam having a shape and number determined by said data signal (col. 9, lines 60-65, and col. 18, lines 40-57 and col. 23, line 48 to col. 24, line 5 and col. 29, lines 4-5).

Dent fails to explicitly further disclose the limitation of "*beam-shaping and power-controlling systems enabling TDMA switching between shaped beam modes and spot beam modes of said antenna*". However, such limitation lacks thereof from Dent reference is well known and disclosed by Reudink.

In accordance with Reudink reference entirety, Reudink discloses a satellite system comprising, among other things, a beam-shaping and power-controlling systems (Fig. 1) enabling TDMA switching (32) between shaped beam modes (Scanning Beams) and spot beam modes (Fixed Beams) of said antenna (col. 3, line 66 and col. 5, line 45) to increase the capacity as well as reducing power requirements and interference (see '578, col. 2, lines 40-49).

Thus, it would have been obvious to those skilled in the art at the time of the invention was made, having the Dent and Reudink references readily available, to implement or incorporate Reudink's beam-shaping and power-controlling system into Dent's system to arrive the claimed invention with a motivation to increase the capacity as well as reducing power requirements and interference (see '578, col. 2, lines 40-49).

Regarding **claim 13**, in addition to features recited in base claim 12 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a timing beacon synchronization data signal ('257, col. 14, lines 40-53 and col. 28, lines 26-28).

Regarding **claim 14**, in addition to features recited in base claim 12 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a multicast/broadcast data service ('257, col. 29, lines 4-10).

Regarding **claim 15**, in addition to features recited in base claim 12 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a calibration data signal ('257, col. 27, lines 41-52).

Regarding **claim 16**, in addition to features recited in base claim 12 (see rationales discussed above), Dent in view of Reudink further discloses wherein one of said plurality of services comprises a point-to-point data service ("257, col. 12, lines 25-32).

Regarding **claim 17**, in accordance with Dent reference entirety, Dent discloses a method for satellite system (FIG. 6) comprising the steps of: generating a data signal comprising plurality of data services (1600; CALLING CHANNEL DATA; and TIMING CONTROL); generating a timing signal (TIMING CONTROL); multiplexing said data signal to generate a TDMA signal (output of block 1601) having a plurality of downlink frame each downlink frame having a plurality of downlink frame slots, wherein each of said downlink frame time slots is dynamically allocated to one of said plurality of satellite services (col. 18, lines 3-21); modulating said TDMA signal to generate a modulated TDMA signal (output of 1602) (col. 18, lines 21-26); broadcasting said modulated TDMA signal using at least one downlink beam, said at least one downlink beam having a shape and number determined by said data signal (col. 9, lines 60-65,

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and col. 18, lines 40-57 and col. 23, line 48 to col. 24, line 5 and col. 29, lines 4-5).

Dent fails to explicitly further disclose the limitation of "*TDMA switching between shaped beam modes and spot beam modes of said antenna*". However, such limitation lacks thereof from Dent reference is well known and disclosed by Reudink.

In accordance with Reudink reference entirety, Reudink discloses a method comprising, among other things, the step of TDMA switching (32) between shaped beam modes (Scanning Beams) and spot beam modes (Fixed Beams) (col. 3, line 66 and col. 5, line 45) to increase the capacity as well as reducing power requirements and interference (see '578, col. 2, lines 40-49).

Thus, it would have been obvious to those skilled in the art at the time of the invention was made, having the Dent and Reudink references readily available, to implement or incorporate Reudink's teaching into Dent's method to arrive the claimed invention with a motivation to increase the capacity as well as reducing power requirements and interference (see '578, col. 2, lines 40-49).

Response to Arguments

4. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ueno et al (USP 5,553,069).

Hwang et al (USP 5,576,721).

Cooper et al, Intelligent Antennas: Spatial Division Multiple Access, Annual Review of Communication, pages 999-1002, 1996.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Duong whose telephone number is (703) 308-5428. The examiner can normally be reached on 7:00AM-3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (703) 308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Frank Duong', with a stylized flourish at the end.

Frank Duong
Examiner
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April 19, 2004